June 24, 1952

Dr. H. B. Woodruff
Research and Development
Merck and Company
Rahway, New Jersey

Dear Dr. Woodruff:

I wish I could answer your letter of the 20th more optimistically, but there is a great deal of work still be he done on the genetics of actinomycetes.

The experiments I've completed with Streptomyces griseus point rather clearly to the occurrence of heterokaryosis. The spores from heterokaryotic colonies segregate out the parental types rather cleanly. One can place a fair degree of confidence in spore-isolation as a means of securing initial genetic purity. Whether recombination occurs at all is a more difficult question. Auxotroph combinations have given prototrophic cultures, but most of these probably stemmed from the resynthesis of heterokaryons. A few stable prototrophs may have been recombinants, but spontaneous reversion has not been excluded. I had some difficulty in introdding second auxotroph mutations to use as markers, owing to the familar loss of ability tomsporulate well on repeated transfer.

At the moment, I am occupied with another problem, but hope to return to Streptomyces before too long, especially if a suitable graduate student should express an interest in it this fall. I would imagine that genetic control of your fermentation cultures would be a matter of the utmost importance to you. If the pace that I have been able to adopt for this work is too slow (as it should appear to you, by my reasoning), I will be glad to collaborate with your group on its development. At present, I would say that a good deal more fundamental research needs to be done before applications will be feasible, but I cannot see how it would fail to be worth your consideration.

Yours sincerely,

Joshua Lederberg

Associate Professor of Genetics